

Australia's mammal extinctions: A 50 000 year history

by Chris Johnson

Publisher: Cambridge University Press 2006.
Paperback ISBN 9780521686600
RRP AU\$49.95

Australian taxa comprise almost half of the 40 mammal species that are known to have become extinct worldwide in the past two hundred years. James Cook University ecologist Chris Johnson examines the disappearances since European settlement of ten marsupial and eight placental (rodent) species in the context of extinctions over the past 130 000 years (the late Pleistocene and Holocene geological epochs). Middle Pleistocene faunas in Australia contained at least 340 species of land mammals, of which 67 are now extinct. These include the giant, wombat-like diprotodons, some weighing up to 2.7 tonnes, the marsupial 'lion', *Thylacoleo*, and 'tiger', *Thylacinus*, and over twenty species of kangaroo.

Johnson identifies three waves of faunal collapse involving a diverse range of species. Mega-marsupials disappeared sometime during the late Pleistocene, medium-sized carnivores in the Holocene and rodents and small marsupials, including bandicoots and rat-kangaroos, over the past two centuries. Johnson evaluates the probable causes of the extinctions through a critique of all the important literature, and incorporates many unpublished sources. Climate change and disease are dismissed as likely causes following a careful analysis of the pattern and timing of extinctions. Johnson instead argues that the mammals disappeared during the 50 000 year occupation of the continent by humans, and concludes that anthropogenic factors were either directly or indirectly responsible. He posits this was from hunting by people and predation by the dingos, foxes and cats introduced by these waves of immigrants.

The magnitude of the mammal extinctions in Australia was unmatched by those elsewhere. For example, South America lost 10 percent of its megafaunal mammals

during the late Pleistocene compared to Australia's 18 percent. In his 1994 monograph, *The Future Eaters* (Reed Books, Melbourne), Tim Flannery argued that the extinctions in Australia were unique, largely due to the naïvety of its fauna, which had not evolved adequate defences to counter the arrival of a new predator, humans. Johnson contends, however, that it was the low birth rates of Australia's mammals that placed them at a disadvantage when faced with exotic predators.

Johnson offers some potential solutions that could reduce the risks of future extinction. Perhaps the most controversial of his ideas is to increase dingo abundances to control foxes and feral cats. He also advocates reintroducing to the mainland those mammals that currently persist only in Tasmania. Johnson speculates that re-establishing a Tasmanian devil population on the south-eastern Australian mainland may suppress the impact of foxes and cats on native mammal faunas.

Australia's Mammal Extinctions is comprehensively researched and well-presented, drawing upon a wide range of data including that provided by biology, ecology, geology and archaeology. Despite covering many disciplines, Johnson's easy-to-read account makes the debate accessible to a non-specialist audience. *Australia's Mammal Extinctions* is highly recommended, particularly for readers interested in ecology and wildlife conservation.

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